

## EXECUTIVE SUMMARY

---

The City of New Westminster's existing water distribution network has over 220 kilometres of pipes, 700 hydrants and 14 pressure reducing valves. Water is supplied to the City through 45 connections to the GVRD mains. The City's water distribution system services the 58,500 residents along with local businesses and industrial properties. It is projected the City's population will reach 84,000 by 2021, through densification and re-development.

Previous water modelling and planning work was completed in the early 1990's. This coupled with the pressure of development and aging infrastructure has triggered the City to commission the preparation of a Water Master Plan. The key objectives of this Master Plan are:

- Identify current and future water demand requirements;
- Evaluate capacity and constraints within the distribution system;
- Develop a list of recommended capital upgrades, including identifying which upgrades are triggered by development; and
- Prepare an implementation strategy and cost estimate to assist the City with prioritizing and budgeting for the recommended improvements.

In 2006 the City's population was estimated to be 58,500, of which an estimated 37,000 live in multi-family dwellings. Based on available water meter records, single-family residents in the City consume 316 Litres/day while multi-family residents consume slightly less at 275 Litres/day. During peak summer days, the consumption rate increases to 632 Litres/day due to household irrigation and lawn sprinkling.

By 2021, changes in land-use and population are expected to increase water demands by 66% over the current conditions. Unless mitigated, this increase will affect fire flows, velocities, pressures and water quality in the distribution system. A computer model of the City's water distribution system was developed and used as a tool to evaluate the hydraulic capacity and constraints in the pipe network (under both 2006 and 2021 demand conditions) and identify where capital improvements are recommended.

Following this assessment, capital improvements were recommended to satisfy the following goals and objectives:

- Improve the level of service to existing users while supporting future development;
- Reduce high velocities within the watermain network;
- Increase system pressures during peak demand conditions (Peak Hour and Fire Flow);
- Increase fire protection, flows and hydrant coverage; and
- Improve water quality throughout the City's system.

The following is a list of the key recommendations of the Water master Plan:

- Over 17 km of watermain improvements (mostly pipe upsizing) are recommended to improve pipe velocities and fire flows for the existing and 2021 demand scenarios. Individual projects within the 17 km's of upgrades have been prioritized in 5, 10 & 20-year time horizons;
- Discussions should also be held with the GVRD to ensure they are aware of the City's 2021 population and demand projections because the GVRD will likely need to upsize their infrastructure to support the City's increased demands. This is particularly important for the GVRD's main along 6<sup>th</sup> Avenue, between 1<sup>st</sup> Street & 8<sup>th</sup> Street;
- In the next 5 years, the City should consider completing a pressure management study to determine areas where HGL's could be safely reduced in an attempt to reduce water loss and minimize pipe fatigue from surge pressures. Water loss is estimated to be 10 – 15% of the City's non-metered demands, which is in-line with local municipalities;
- Additional fire hydrants are required throughout the City to improve hydrant coverage, particularly as development occurs in Queensborough;
- Water quality was found to be generally good throughout the City. A low to moderate water age of 1 to 5 days is predicted in the system. Additionally, 98% of the City is predicted to achieve a minimum chlorine residual of 0.2 mg/L. Both of these targets are reasonable and in-line with other local municipalities; and
- A lowered hydraulic grade as a result of the GVRD's Seymour Filtration Plant is not expected to impact the supply and model boundary conditions for the City.

All together a total of **\$15.3 Million** of Water System Capital Improvements, including new and replacement watermains, PRVs, and hydrants are recommended for the City. Approximately 73% (or \$10.9 Million) is attributed to existing system improvements while the remaining \$4.4 Million is attributed to future OCP improvements (DCC Revenue) as indicated in **Table ES-1**.

**Table ES-1: Water System Improvement Costs**

Revenue Source	Length	Subtotal	35%Engineering / Contingency Allowance	Total Cost
Existing Revenue	11.8 km	\$8.1 Million	\$2.8 Million	<b>\$10.9 Million</b>
2021 / DCC Revenue	5.2 km	\$3.3 Million	\$1.1 Million	<b>\$4.4 Million</b>
<b>TOTAL</b>	<b>17.0 km</b>	<b>\$11.4 Million</b>	<b>\$3.9 Million</b>	<b>\$15.3 Million</b>